



Texas Department of Transportation

Independent Audit Services - Consideration of Cost in the Consultant Selection Process Evaluation

April 15, 2008

Executive Summary



After the completion of a series of independent performance audits of the Texas Department of Transportation (TxDOT) in July 2007, the TxDOT Audit Oversight Committee (AOC) retained Dye Management Group, Inc. to evaluate the opportunities for bringing price competition into the process through which Architectural, Engineering and Surveying consultant services are procured (abbreviated as A/E).

A. Approach

TxDOT's A/E consultant service procurement occurs through a process known as Qualifications-Based Selection (QBS) that prohibits consideration of cost in consultant selection. This process is regulated by state and federal laws.

The study approach was structured to evaluate two questions:

- Within the constraints of the legally mandated QBS process, how can TxDOT increase competition and get better price or cost outcomes?
- What is the experience elsewhere with A/E procurement that includes an evaluation of cost and what are the implications for alternative approaches to the procurement of A/E services by TxDOT?

The broader issues of project scope and cost management for A/E consultant work, while an important component of the ultimate cost for preconstruction, were not the focus of this analysis.

1. Evaluation of TxDOT's QBS Process

The approach to determine how TxDOT can best address its financial interests within the constraints of the QBS process involved the following analysis steps:

- Evaluation of the documented business rules and process
- Interviews with TxDOT staff members in Austin
- Interviews with TxDOT staff members (e.g. Director of contract administration, consultant contract engineer, district design engineer) in selected TxDOT districts
- Identification and assessment of the capabilities and tools available to support TxDOT negotiators in the negotiation process
- Analysis of available quantitative data on the outcome from the negotiation process

2. Identification and Evaluation of Non-QBS Procurement Experience

The approach involved the following steps:

- Conducting screening research of states, other units of government, and Canadian provinces that have the authority to consider cost in the selection of A/E consultants
- Interviews with all identified state agencies and Canadian provinces procurement officials to identify the extent to which they use non-QBS procurement and their perspectives on the outcomes from this process
- Conducting interviews with private sector design-builders and associated professionals to identify how they consider cost in their purchase of subcontracted A/E services in design-build and concession procurement models

B. TxDOT Administration of QBS

1. Findings

We identify the following risk areas that affect TxDOT's ability to negotiate fair and reasonable contracts:

- **Need to strengthen the capabilities of district TxDOT negotiators to negotiate fair and reasonable price**

For most TxDOT negotiators, the role of project procurement involves a different set of competencies and educational background than that which they have used to exercise their preconstruction engineering responsibilities. Many learn on the job and are not trained in negotiations or project financial management.

- **TxDOT does not have specific guidance or business rules outlining negotiation objectives**

The approach taken for negotiation appears to be ad hoc differing between TxDOT negotiators, districts, and divisions. While TxDOT's business objective is "fair and reasonable" prices, there are no guidelines or business rules for employees to operate under regarding what are acceptable overhead rates, profit levels, and labor rates or where and when to negotiate these items.

- **TxDOT staff will be in a stronger position to negotiate with information on contracts and the outcomes from prior negotiations with each A/E firm**

TxDOT staff members do not have all the information that they need to determine a negotiation strategy or approach to fair pricing. Information that could support negotiations includes: the disposition of prior negotiations, current negotiated overhead and fee information, volume of work already under contract, and a firm's

prior track record in cost control and management. As a result, most of the negotiations are based on individual negotiator's prior experience.

- **Risk that districts use sequential work authorizations on indefinite deliverable contracts to circumvent the required headquarters approval for work authorizations of \$1 million or more**

Interviews indicated that A/E firms, instead of being given a single work authorization for a project assignment, may be given sequential work authorizations for the same project that effectively circumvents the intent of contract oversight and control by headquarters based on dollar thresholds. Headquarters approval is required to execute all single work authorizations of \$1 million or more on all indefinite deliverable contracts.

- **While the indefinite deliverable contracts provide flexibility to the districts, a concern raised is that these contracts are sometimes used for procuring services that are not strictly professional services**

Interviewees cited examples of work such as web site design, surveys, and market research that is conducted through an A/E contract. Dye Management Group, Inc. did not audit a sample of contracts to determine the extent to which this occurs. For relatively small subcontracts it is more efficient for a prime contractor to purchase their services this way. For TxDOT, however, for larger contracts this increases work that is procured under QBS.

2. Recommendations

The recommendations involve building on current policies, practices, and procedures to provide greater specificity and consistency to enable the negotiation of fair and reasonable price for A/E services.

Recommendation 1: Establish greater specificity for TxDOT business objectives and guidelines for TxDOT negotiators to apply during negotiations.

The intent of this recommendation is to provide greater specificity regarding what fair and reasonable means to TxDOT. Implementation of this recommendation should leave the negotiator flexibility but it also needs to provide specific ground rules to use as a basis for each negotiated item.

Recommendation 2: Implement organizational development and training to strengthen project procurement and negotiation competencies.

This recommendation addresses the current situation in which many TxDOT personnel do not have the background and experience to effectively negotiate. The recommendation fits within a broader cultural and organizational change that would focus on project cost and project scope management within project delivery. Under

this recommendation, TxDOT will provide training, support, and tools to TxDOT contract managers to help improve their negotiation skills.

Recommendation 3: Maintain information on A/E contracts and negotiation outcomes to support TxDOT personnel during negotiations.

This recommendation is to specify the information on current and past contracts that can better support negotiations. This includes maintaining a historical record of all negotiations and rates.

Recommendation 4: Review A/E procurement including the use of indefinite deliverable contracts in the context of TxDOT project schedule, project cost, and project scope management

This study identified concerns by TxDOT personnel regarding consultant cost management and the length of time it takes to procure A/E services. Evaluation of these issues was not the subject of our analysis. However, based on our understanding of project delivery management best practices and observation on TxDOT's situation, we understand that the most effective way to evaluate the outcomes from A/E procurement and management practices is by evaluating project cost, project schedule, project quality, and project scope management. Such an analysis should focus on TxDOT's product "plans that are biddable and buildable".

C. Consideration of Cost in A/E Procurement

1. Conclusions

- **Our analysis identified a number of barriers to TxDOT realizing business benefits from the cost savings from non-QBS procurement**

Our analysis has neither found quantified examples elsewhere nor been sufficient to specify net business benefits to TxDOT of implementing non-QBS procurement for A/E consultant services. Given the barriers to changing the current process, our conclusion is that TxDOT should first ensure that within the legal constraints of the current QBS process TxDOT gets the best possible value, fosters competition, and is better positioned to negotiate a fair and reasonable price.

- **Implementing non-QBS procurement is a major departure from current practice**

While it seems intuitive that price should have some consideration in the selection of consultants that provide some \$450 million a year in A/E services, only a decreasing handful of states use procurement methods other than QBS. As a result, for TxDOT to pursue non-QBS procurement would be a major departure from practice elsewhere. It would require changes to state law that would be strongly opposed by the A/E services industry and be a process that could be applied only to state funded projects.

- **There are almost no examples of governmental agencies using non-QBS procurement methods**

Research finds very few examples of governmental agencies that consider cost in A&E consultant procurement. Further, the trend for those agencies that have the authority to consider cost is actually towards a QBS type of approach.

- **The circumstance where non-QBS procurement is most viable is where there are well defined straight forward scopes of work**

The principal barrier to the consideration of cost is the need for a well defined scope of work.

2. Recommendations

Recommendation 5: Limit the dollar value of non A/E work performed through A/E contracts

To introduce price competition, TxDOT should limit the dollar value of work that can be exempt from QBS that is performed through A/E contracts. This threshold should be high enough to ensure that TxDOT benefits from the economies of scale on a full service A/E project. However, TxDOT should establish a clear definition of non A/E services. Specialty services with term agreements and purchase orders can be procured with consideration of price. For example, travel surveys, market research, public relations and public information, might not require a professional engineer and might not be considered a professional service.

I. Introduction



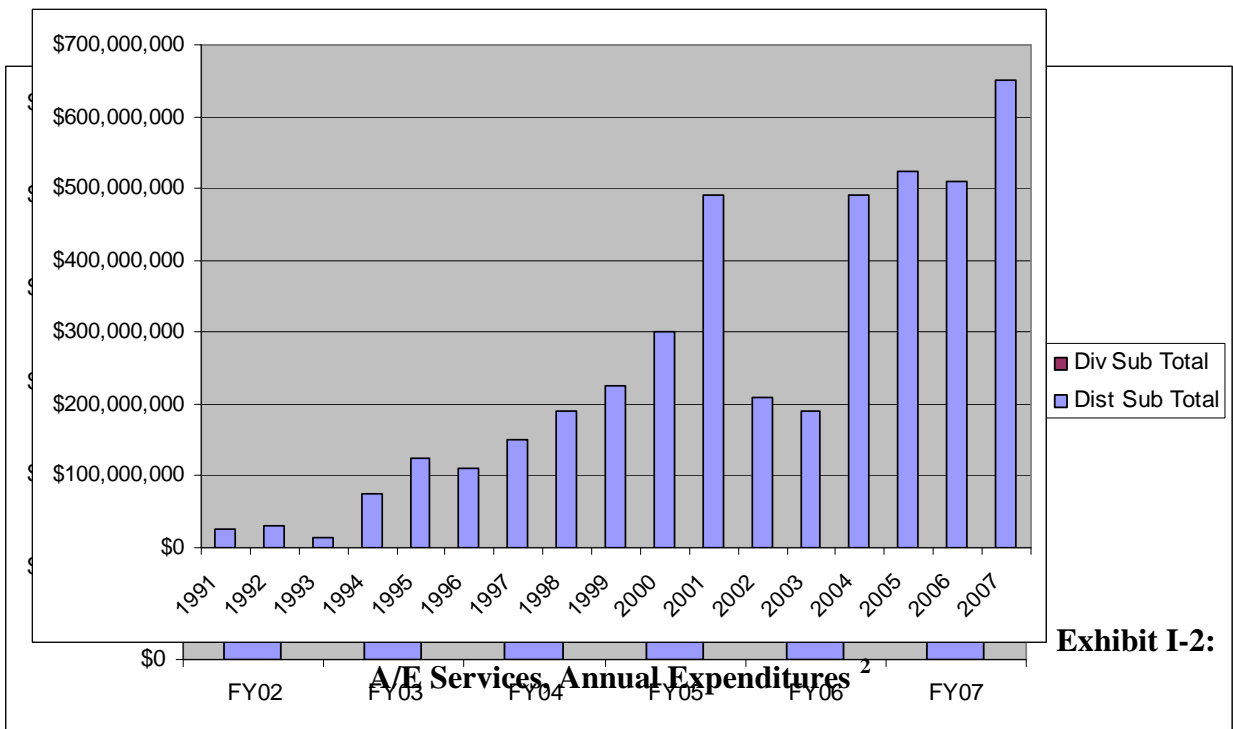
After the completion of a series of independent performance audits of the Texas Department of Transportation (TxDOT) in July 2007, the TxDOT Audit Oversight Committee (AOC) retained Dye Management Group, Inc. to evaluate the opportunities for bringing price competition into the process through which Architectural and Engineering (A/E) consultant services are procured. This issue was raised to explore other avenues to advance TxDOT's policy to increase competition and pursue market based solutions that provide better value to Texas taxpayers and road users.

A. Scope of Analysis

A/E consultant services are a very important element of project delivery in Texas. These services provide the engineering and related expertise necessary to produce construction plans (designs) that provide the blueprint for highway construction projects. The role of A/E consultant services in project delivery has grown such that by fiscal year 2007, expenditures on these services were about \$450 million. Exhibits I-1 and I-2 show the increase in the value of contracts and expenditures on these services over time.

Exhibit I-1: Dollar Volume of A/E Consultant Contracts Executed 1991-2007¹

¹ Source: TxDOT Design Division, Consultant Management/Administration Pilot Class documentation October 29, 2007 to November 2, 2007



A/E services are procured through a legislatively regulated process known as Qualifications-Based Selection (QBS). Costs are negotiated after selection and prior to contract execution. There is provision to negotiate with a second provider if negotiations

² Source: TxDOT Design Division, Consultant Management/Administration Pilot Class documentation October 29, 2007 to November 2, 2007

with the first are terminated. Cost is prohibited from consideration under QBS. Given the magnitude of TxDOT's expenditures on A/E services, the overall direction for this study was to investigate how cost considerations can be brought to bear in the selection process.

To focus the analysis, interviews were conducted with AOC members and input provided from the Texas Transportation Commission chairman. Dye Management Group, Inc. concluded from these interviews that the most important issue for TxDOT is to ensure that the agency gets the best possible quality and price from the professional A/E services that are procured. This is no different than any market based transaction for which product quality is important. For this study the issue is how price or cost considerations are addressed in procurement/selection. The broader issues of project scope and cost management for A/E consultant work, while an important component of the ultimate cost for preconstruction, were not the focus of this analysis.

TxDOT's A/E consultant service procurement rules are regulated by state and federal laws. Therefore, the study approach was structured to evaluate two questions:

- Within the constraints of the legally mandated QBS process, how can TxDOT increase competition and get better price or cost outcomes?
- What is the experience elsewhere with the A/E procurement that includes an evaluation of cost and what are the implications for alternative approaches to the procurement of A/E services by TxDOT?

AOC members also raised questions about the length of time A/E procurement can take and the prevalence of the use of indefinite deliverable contracts. A detailed analysis of these important issues was beyond the scope of this project.

B. Methodology

The approach to address the analysis questions is described below.

1. Evaluation of TxDOT's QBS Process

The approach was designed to determine how TxDOT can best address its financial interests within the constraints of the QBS process. This involved the following analysis steps:

- Evaluation of the documented business rules and process
- Interviews with TxDOT staff members in Austin to obtain perspective on actual practice and input regarding opportunities for getting more favorable prices for A/E work
- Interviews with TxDOT staff members (e.g. Director of contract administration, consultant contract engineer, district design engineer) in selected TxDOT

districts to obtain perspective on actual practice and input regarding opportunities for getting a better price for A/E work

- Identification and assessment of the capabilities and tools available to support TxDOT negotiators in the negotiation process
- Analysis of available quantitative data on the outcome from the negotiation process

2. Identification and Evaluation of Non-QBS Procurement Experience

The approach involved the following steps:

- Conducting screening research of states, other units of government, and Canadian provinces that have the authority to consider cost in the selection of A/E consultants
- Interviews with all identified state agencies and Canadian provinces procurement officials to identify the extent to which they use non-QBS procurement and their perspectives on the outcomes from this process
- Conducting interviews with private sector design-builders and associated professionals to identify how they consider cost in their purchase of subcontracted A/E services in design-build and concession procurement models.

C. Organization

The report is organized into the following sections.

Section II. Background. This section defines QBS and presents the history of its implementation and use. This section reviews the issues facing architectural and engineering procurement today.

Section III. TxDOT Administration of QBS. This section presents an overview of the TxDOT process with special attention placed on the negotiation process. It also analyzes the capabilities and tools available to district personnel in selecting and negotiating contracts. It provides recommendations for improvements within the current procurement system.

Section IV. Non-QBS Procurement Practices. This section presents the results from the research into the use of non-QBS procurement practices elsewhere. The section also presents conclusions regarding the applicability of these methods at TxDOT.

II. Background



QBS requires governmental agencies to select and negotiate contracts based on demonstrated competence and qualifications for the type of engineering and design services being procured. Once a vendor is selected, the government then negotiates a fair and reasonable price. If the negotiations are not successful with the first selected provider then TxDOT may then move on to negotiate with the provider that is ranked second.

In Texas, QBS applies to all state agencies and local governmental units and is actively enforced. The Texas Professional Services Procurement Act states:

In procuring architectural or engineering services, a government entity shall:

- 1) First select the most highly qualified provider of those services on the basis of demonstrated competence and qualifications; and*
- 2) Then attempt to negotiate with that provider a contract at a fair and reasonable price.³*

This section provides background on QBS.

A. History and Extent of Use

QBS is the nationally established mechanism for procuring A/E services. Federal law must be followed in every state for the expenditure of federal funds and the vast majority of states have their own laws that regulate the procurement of A/E services by their state and local agencies.

1. Federal Regulations

In 1972, the United States Congress passed Public Law 92-582, known as the Brooks Act. The law states:

The Congress hereby declares it to be the policy of the Federal Government to publicly announce all requirements for architectural and engineering services, and to negotiate contracts for architectural and engineering services on the basis of demonstrated competence and qualification for the type of professional services required and at fair and reasonable prices.⁴

³ Texas Professional Services Procurement Act. Texas Government Code Chapter 2254, Subchapter A. (1993)

⁴ Brooks Act. Public Law 92-582. (1972)

The professional services that fall under the Brooks Act are defined by the Federal government as: “program management, construction management, feasibility studies, preliminary engineering, design, engineering, surveying, mapping, or architectural related services with respect to a construction project” performed by a state transportation agency.⁵ The federal statute includes both horizontal and vertical construction.

The law was extended in 1982 to military procurements, and in 1984 to all Executive Branch agencies. All state and local departments of transportation that procure engineering and design consultants for projects with Federal-aid highway funding are required to follow the Brooks Act.⁶ QBS does not currently apply to federal design-build procurements.

2. State Regulations

Since the passage of the Brooks Act, forty-six states have enacted QBS laws that apply to the expenditure of state funds. Many state QBS laws also extend to local government units. In addition, many non-governmental and quasi-governmental transportation entities, such as toll authorities, use QBS. A number of those states and localities without QBS laws procure using QBS.

B. QBS Advocates

A number of professional organizations undertake significant efforts to advocate for QBS in state and local jurisdictions. These organizations include:

- American Council of Engineering Companies (ACEC)
- American Institute of Architects (AIA)
- American Public Works Association (APWA)
- National Society of Professional Engineers (NSPE)

These organizations are active proponents of QBS. ACEC has active advocacy groups in all fifty states, and AIA is active at the state and local levels. For those agencies not bound by QBS, the organizations publish step-by-step QBS manuals and members can provide pro-bono consultation to procurement officials.

1. Proponents’ Arguments

QBS proponents argue that the QBS process, above all, results in the selection of the most qualified design professional for the project. Most frequently QBS is contrasted

⁵ U.S. Department of Transportation, Federal Highway Administration. 23 CFR Part 172. (2002)

⁶ FY 2006 Federal Appropriations Act. Public Law 109-115, 119 Stat. 239. (2005)

to a low bid procurement method. The argument made is that QBS is needed to ensure that selections are based on capabilities. This protects the public interest by focusing on qualifications and discouraging cost-cutting, which can lead to an inferior product.

A further argument is that once selected, state agencies are free to negotiate a fair price. Under most state laws it is possible to negotiate overhead and rates for job classifications. However, the Brooks Act precludes states from negotiating reductions in federally certified overhead rates for federally funded projects.

In those States where legislation has been introduced to alter QBS laws to include price consideration, the efforts have not been successful. The professional organizations listed above have proved to be strong proponents for QBS.

2. Opponents' Arguments

Opponents tend to accept that quality is prerequisite for professional services; however, they argue that all else being equal, price competition is in the public interest. Opponents to QBS are mainly focused on cost savings; they argue that the top firms competing for a project have equally impressive qualifications, and allowing those firms to compete on price would not affect the quality of the product. They point to procurement models in which price is considered along with qualifications and argue that some consideration of price would result in price competition.

A consequence of the Brooks Act is that once the best qualified consultant is selected, negotiation around fair and reasonable prices is based on inputs – that is how many hours it should take to do the work. Pricing is then based on the application of an overhead and fee. This is quite different to a performance oriented view in which pricing is based on the output. It results in a situation in which all else being equal the least efficient organization, the one with the highest overhead, receives more compensation for identical work than a more efficient firm. In this way there is no incentive for efficiency.

Opponents also argue that:

- QBS negotiations are time-consuming
- The most qualified firm may be able to underbid competitors due to technological and technical innovations
- There is no evidence that the inclusion of cost as an element in selection would impact quality. They argue that there is no evidence that the low bidders are always awarded contracts or that the most qualified firms do not submit low bids

III. TxDOT Administration of QBS



TxDOT and all other governmental entities in Texas that procure professional services must use QBS to procure architectural, engineering, and land surveying services. Texas law (Subchapter A, Chapter 2254, Government Code) specifies that governmental entities in Texas that procure A/E services must adhere to the following two-stages:

- Stage 1 - Firms are ranked based on demonstrated competences and qualifications
- Stage 2 - Negotiations for a fair and reasonable price begin with the most qualified firm as determined by stage 1⁷

During the first stage, the term “qualifications” can encompass qualifications-based criteria that are established by a Consultant Selection Team (CST), but must include an evaluation of project understanding and approach, the project manager’s experience with similar projects, and similar project-related experience of the task leaders responsible for the major work categories identified for the project or contract. Supplemental criteria to determine qualifications that have been used include: skills and technical competence of staff, team capacity to undertake more work (availability of key personnel), and understanding of the clients’ needs. The firm scoring highest marks in the mandated as well as supplemental categories is deemed “most qualified”.

Once the first stage of the selection process is complete, the state may enter into cost negotiations with the “most qualified” firm. The state can negotiate cost with only one firm at a time. If this “most qualified” firm and TxDOT are not able to negotiate to a “fair and reasonable” price, the state then engages the second most qualified firm for negotiations. At this point, TxDOT is prohibited by law from going back to the top ranked proposer and renegotiating. Cost negotiations proceed around design inputs - hourly rates, overhead, profit margin, and total number of design hours (dependent on project type).

A. Organizational Roles and Capacity

A/E or land surveying services are primarily acquired by the TxDOT divisions and each district office’s contract administration division. The consultant contract office, a part of the headquarters design division in Austin, provides oversight and support during the process.

1. Districts Roles and Capacity

To procure A/E services, a district forms a consultant selection team that performs the following primary tasks:

⁷ Texas Code § 2254.004 Professional Services and Procurement Act

- Prepare Notice of Intent (NOI)
- Conduct briefing meetings
- Review A/E qualifications
- Conduct A/E interviews
- Negotiate contract

Interviews were conducted with headquarters and district personnel to identify roles, responsibilities, and practices in negotiating A/E contracts. For good business reasons there are differences between TxDOT districts in their organizational division of roles and responsibilities for A/E consultant selection, negotiation, and management. To generalize, the district consultant selection team is composed of a selection team chair, a project manager, and at least one other staff member. The project manager usually acts as the primary negotiator on the project, but the negotiator on each project may vary depending on the experience and availability of other staff members.

The project manager can vary on each project, and different team members within TxDOT may be appointed as project managers. During our interviews, some of the TxDOT staff members identified as project managers were: Director of transportation planning and development, Director of contract administration, District design engineer, Consultant contracts engineer, or Projects director for consultant selection.

The primary project negotiator is referred to as the “TxDOT negotiator” in this report for consistency.

Based on analysis of documented procedures and interviews to determine actual practices, we identify the following risk areas that affect TxDOT’s ability to negotiate fair and reasonable contracts:

- **Need to strengthen the capabilities of district TxDOT negotiators to negotiate fair and reasonable price**

For most TxDOT negotiators, the role of project procurement involves a different set of competencies and educational background than that which they have used to exercise their preconstruction engineering responsibilities. Many learn on the job and do not have any specific training in negotiations or project financial management. They are usually staff members with an engineering background but no formal negotiation training. The TxDOT consultant contract office does provide the negotiators with training on the process, but most of the training concentrates on the process and the governing laws, without going into the softer side of negotiations. As a result, negotiations on each project and each district vary significantly based on the negotiation skills and experience of the TxDOT negotiator. Also, different groups in districts manage different contract negotiations, and there is no systematic central oversight at the district level.

- **TxDOT does not have specific guidance or business rules outlining negotiation objectives**

The approach taken for negotiation appears to be ad hoc differing between TxDOT negotiators, districts, and divisions. While TxDOT's business objective is "fair and reasonable" prices, there are no guidelines or business rules for employees to operate under regarding what are acceptable overhead rates or where and when to negotiate on overhead rates, labor classification, or fee are very general.

For example, if market conditions are such that there is less work for A/E firms, then TxDOT is in a stronger position to negotiate because there is more consultant demand for work than work. In this circumstance TxDOT is in a better position to negotiate on price based on market conditions. Another example is that TxDOT will be much more effective in reducing cost by negotiating on overhead as opposed to fee but such strategies are not discussed or established. There is no systematic approach to establishing negotiating strategies which account for market conditions, the volume of work TxDOT is soliciting and other factors.

This situation is compounded by TxDOT's staff turnover. Currently, many of the negotiators do not have a lot of prior experience with negotiations. The outcome of the negotiation process is not documented on some of the projects, making it difficult to improve in the future based on past experience.

2. **Consultant Contract Office (Headquarters Design Division)**

The consultant contract office, a part of headquarters' design division, assists the districts in the following primary tasks:

- Posting the Notice of Intent (NOI) on TxDOT's site
- Reviewing documents submitted by the most qualified A/E firm and consenting to award
- Reviewing contract contents
- Providing training and capacity building support to districts

The consultant contract office provides training on consultant management and administration to contract managers.⁸ This includes a recently developed manual and training that addresses good contracting practices. These materials are comprehensive and provide clear guidance on the process, legal requirements, and TxDOT business rules. Topics include: roles, responsibilities, laws governing the process, professional and non-professional services, consultant selection and award (e.g. evaluation sheets), contract and negotiations (e.g. guidance on engineering and professional descriptions, PS&E hourly rate ranges, guidance on direct expenses), agreement development and

⁸ Consultant management and administration resource materials (DES615)

execution, project management and contract administration (e.g. progress reports.), and consultant relationship (e.g. post employment restrictions, relevant laws).

The training provides basic information to the contract managers. TxDOT, however, does not have guidance and training that is specific to what the agency seeks in negotiating a “fair and reasonable price”. The training does not cover negotiation strategies, tactics, or other negotiation components.

Based on analysis of documented procedures and interviews to determine actual practices, we identify the following risk areas that affect TxDOT’s ability to negotiate fair and reasonable contracts:

- **TxDOT staff will be in a stronger position to negotiate with information on contracts and the outcomes from prior negotiations with each A/E firm.**

TxDOT staff members do not have all the information they need to determine a negotiation strategy or approach to fair pricing. Information that could support negotiations includes: the disposition of prior negotiations, current negotiated overhead and fee information, volume of work already under contract, and a firm’s prior track record in cost control and management. As a result, most of the negotiations are based on individual negotiator’s prior experience.

B. Types of A/E Contracts

TxDOT issues two different types of contracts:

- Specific deliverable contracts, commonly referred to within TxDOT as project-specific contracts, and
- Indefinite deliverable contracts referred to within TxDOT as evergreen contracts

1. Specific Deliverable Contracts (Project-Specific Contracts)

About 10% of all TxDOT A/E contracts are specific deliverable contracts (project-specific contracts), but due to their size they make up a large percentage of the total dollar value of contracts. Procurement for project-specific contracts involves the qualifications based selection of an A/E firm to perform a scope of work that is specified in a request for proposals. The level of specificity varies from project to project.

Most of the project specific contracts are over \$2 million in value. Project specific contracts between \$2 and \$15 million usually have a well defined scope of work, but bigger contracts, even though project specific, often do not have a well defined scope of work at time of procurement, primarily due to the size of the project. Contracts for most of these projects are established a general scope of work.

2. Indefinite Deliverable Contracts

TxDOT puts in place indefinite deliverable, or evergreen, contracts in order to have a pool of A/E firms under contract that can then perform work on individual projects to meet district and division needs. Currently, some 90% of TxDOT A/E contracts are issued as indefinite deliverable contracts. Indefinite deliverable contracts are issued for both full A/E services as well as discipline specific (for example, bridge inspection, hydraulics) services. About 70% of indefinite deliverable contracts are discipline specific. These are priced based on the hourly rates, fees, and overhead rates that are negotiated by TxDOT for the indefinite deliverable contracts. Negotiations on indefinite deliverable contracts do not include design hours, since the scope is largely unknown.

The primary intent of indefinite deliverable contracts is to increase efficiency and reduce procurement time for the districts for smaller A/E projects and to provide them with some flexibility in the procurement process. Districts put in place indefinite deliverable contracts with A/E firms with which they can then directly negotiate work scope. Discipline specific contracts also enable TxDOT to award work to smaller companies which specialize in discipline specific work, thereby inducing market competition. The Texas Transportation Commission has authorized indefinite deliverable contracts of up to \$2 million in value, but prior approval may be granted in special circumstances to exceed this cap. The districts issue work authorizations against the indefinite deliverable contracts to assign project specific work. Districts have the authority to issue individual work authorizations of up to \$1 million in value.

The districts issue work authorizations against the indefinite deliverable contracts to assign work to the A/E firms and negotiate work hours at the time of issuing work authorizations. Under an indefinite deliverable contract, the districts have the authority to negotiate work authorizations without design division consultant contract office approval – because there is a contract in place. The only exception is when the work authorization is \$1 million or more, or a supplemental work authorization increases the overall work authorization to \$1 million or more, in which case the authorization needs approval from the design division consultant contract office. This in effect provides the districts increased contract authority and flexibility to assign consultants.

A key element of getting a good deal and securing value from A/E contracts is the effectiveness of the management and administration of project procurement, project scope, and project cost management. These are all project management disciplines with an accepted body of best practice against which TxDOT's process can be evaluated. The purpose of Dye Management Group, Inc.'s analysis was not to audit A/E consultant procurement processes or project cost management but to assess opportunities for price competition in A/E procurement. Our analysis of A/E procurement focuses on how TxDOT can ensure competition and protect its interests in price negotiation within the constraints of QBS. Based on our interview results and summary data we identify two issues that impact TxDOT's current process:

- **Risk that districts use sequential work authorizations on indefinite deliverable contracts to circumvent the required headquarters approval of for work authorizations of \$1 million or more.**

Interviews indicated that A/E firms, instead of being given a single work authorization for a project assignment, may be given sequential work authorizations for the same project that effectively circumvents the intent of contract oversight and control by headquarters based on dollar thresholds. Headquarters approval is required to execute all single work authorizations of \$1 million or more on all indefinite deliverable contracts. This circumvention is done because of concern about the length of time it can take for review and approval of the contract by headquarters' design division.

- **While the indefinite deliverable contracts provide flexibility to the districts, a concern raised is that these contracts are sometimes used for procuring services that are not strictly professional services**

Interviewees cited examples of work such as web site design, surveys, and market research that is conducted through an A/E contract. Dye Management Group, Inc. did not audit a sample of contracts to determine the extent to which this occurs. In such examples a design contract is bundled with other services instead of being issued as a separate (non-professional) contract to prevent a lengthy contracting process. For relatively small subcontracts it is clearly more efficient for a prime contractor to purchase their services this way for TxDOT, however, for larger contracts this increases work that is procured under QBS. TxDOT has the opportunity to procure these services through a best value or similar process.

C. Negotiation Process

Under the QBS process there is no price competition between firms for specific assignments. Under the process TxDOT is able to negotiate the price of the labor or other inputs into performing A/E work with the top ranked firm. In this way TxDOT can negotiate hourly labor rates, over head, fee, and the number of hours to perform work. However, under federal law for federally funded work, TxDOT cannot negotiate down a federally certified overhead rate. Within these constraints TxDOT has authority to negotiate a "fair and reasonable price". TxDOT does not have the authority to choose between firms based on price.

This section briefly explains the criteria for negotiation on each of the four primary cost-related negotiation factors on a project and then presents findings regarding what happens in practice.

1. Hourly Rates by Labor Classification

a. Procedure

The hourly rates for each labor class for the project are discussed and negotiated if required. The minimum and maximum hourly rates for each labor classification are negotiated with the consultants. After work on the project begins, the actual amount paid to the A/Es equals the rate paid by the A/Es to their employees. If this amount is higher than the negotiated range, the maximum rate from the range is paid. If this amount is lower than the negotiated range, the minimum rate from the range is paid.

b. Practice

In practice, different consulting firms report hourly rates differently – some of the firms include benefits as a part of the hourly rate, while other firms report benefits as a part of the overhead rate. As a result, negotiations on each project vary and it is difficult for TxDOT to set benchmarks for hourly rates. The hourly rates for the same labor class vary based on the geographic location of the firm and TxDOT district. TxDOT negotiators base their negotiations on their past experience and any informal data available. The fact that TxDOT currently does not maintain a database of all rates and ranges negotiated on the projects, makes it difficult to compare, say, rates of the same company on different but similar projects.

2. Profit Margins

a. Procedure

The profit margins are regulated by law to be between 10% and 15% of salary and overhead on all projects. TxDOT personnel explained that the profit margins are usually dependent on the project size, complexity, duration, and the risk involved on the project - a complex or high risk project usually justifying a higher profit margin. TxDOT's published procedure mentions that the TxDOT negotiators should "use good judgment" in these negotiations, but does not provide any more specific guidance.

b. Practice

In practice, the profit margins are usually 12% and up to 15% on more complex projects. TxDOT rarely finds that the A/E firms propose a lower profit margin. Interviewees reported that they negotiate on profit but contracts rarely are at 10% profit. In practice there is no systematic guidance or approach to establishing profit or considering what level to set it at in the procurement process. For

example, for a large dollar volume project TxDOT might want to seek a lower profit as this is effectively a volume discount but there is no guidance to this end.

3. Overhead Rates

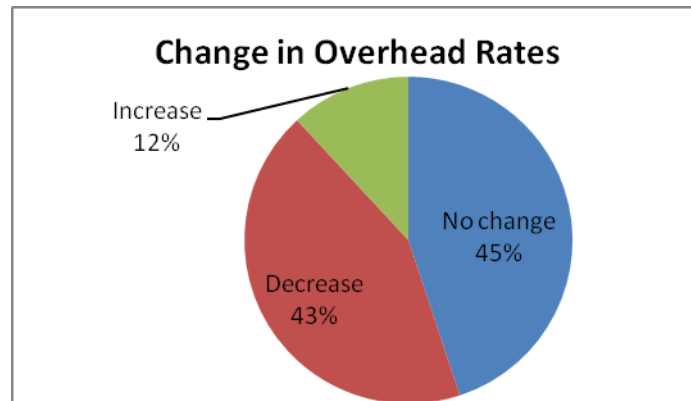
a. Procedure

The overhead rates for each company are usually audited internally by the company/CPA firms for prime and subcontractors over \$250,000, and the audits are provided to TxDOT. The managing office reviews these rates to ensure compliance. On federally funded projects, TxDOT is required to pay the federally certified audited overhead rates. On state funded projects, the managing office usually negotiates overhead rates to ensure that the rates are comparable to other companies of the same size. The exception is contracts that are less than \$250,000, when A/Es are not required to submit an audited overhead rate. TxDOT training provides details on overhead rates from audits on file.

b. Practice

Since the overhead rates provided by A/Es are usually the audited rates, negotiation is not permitted on federally funded projects. On state funded projects, in practice, the overhead rates are around 1.6 (160%), but can go up to 2.0 (200%) for some companies. TxDOT negotiates the overhead rates with A/Es, aiming to have similar rates between different companies and on different projects. The end result of the negotiations is highly dependent on the experience of the TxDOT negotiators. As mentioned earlier, A/Es are not required to submit audited overhead rates for contracts less than \$250,000.

Data were reviewed to determine the outcome from negotiations. The results are shown in Exhibit III-1. Overhead rate data available for the last two years indicates that after negotiations, the overhead rates remained the same on about 45% of the projects, decreased on 43% of the projects, and increased on about 12% of the projects.

Exhibit III-1: Change in Overhead Rates

Of all negotiations on which the overhead rates decreased after negotiations, the majority of the decrease was between 5% and 10%. The majority of projects on which the rates are lowered are the ones on which the A/Es either did not provide an audited overhead report (contracts less than \$250,000), or provided an incomplete report. On other projects, the decrease can be attributed to the contract manager's negotiation skills.

Of the 12% of the projects on which the overhead rate actually increased, most increases were less than 5%.

These increases are attributed to three reasons:

- For contracts less than \$250,000, the A/E firms are not required to submit overhead rates, and the TxDOT negotiators are not always aware of the overhead rates. This leads to an increase over the audited rates in some cases. Audited rates for these projects have been obtained from TxDOT analysis of other projects the same A/E firms were involved in.
- For some projects, the districts have information that is more up to date than is used in the negotiation analysis here. Since overhead rates are more likely to rise in updated information, that may have caused some projects to reflect overhead rate increases, while in actuality, the overhead rates may not have increased.
- The lack of experience of the negotiators on some projects is believed to have caused an increase in the negotiated overhead rates compared to the audited rates.

4. Work Hours (Level of Effort)

a. Procedure

On project specific contracts, work hours are negotiated at the same time as the above mentioned negotiations. On indefinite deliverable contracts, work hours are negotiated when project-specific work authorizations are ready to be issued. TxDOT procedures mention that the negotiator should develop an independent estimate, and should consult discipline-specific staff members and other districts as required to develop an estimate. This estimate should be discussed with the A/E firm as required to ensure that the project scope understanding is consistent between both parties. The scope can be revised for clarity if necessary.

b. Practice

Work hour negotiations on project specific contracts add value only when the project is well scoped. If the scope of the project is not well defined, it becomes difficult to negotiate hours. In practice, mid-sized project-specific contracts (\$2-\$15 million range) tend to have a well defined scope, while bigger projects usually contain a general scope of work. The sophistication, understanding of the project, and the negotiation skills of the TxDOT staff play an important role in these negotiations. TxDOT's estimate of hours depends on the time availability of the negotiator and other team members, and is not always well-prepared, primarily due to experience and time constraints.

The Brooks Act and QBS in general limit TxDOT's ability for meaningful negotiation. TxDOT should only review hours to make sure they are reasonable to get the job done. An A/E firm will want to make sure that there are adequate hours budgeted to do a quality job. A reduction in hours increases the risk to both TxDOT and the A/E firm. To a certain extent, a highly qualified firm should require less hours because they have the intellectual capital to be more productive – the firm uses fewer hour to perform the same amount of work. The A/E firm does not have much incentive to negotiate down any of the rates or hours. The only negotiating factor in TxDOT's favor at this point is the ability to move to the second most qualified firm if the negotiations are unsuccessful.

On indefinite deliverable contracts, work hours are negotiated when project-specific work authorizations are ready to be issued, at which point the project scope should be well defined. The negotiations at this point are usually a formality unless the two parties notice major differences, as the A/E is already on a contract and will be working on the project anyway.

5. Selecting the Second Most Qualified Firm

a. Procedure

If the negotiation with the most qualified A/E firm is not successful, and all the factors cannot be mutually agreed upon, then the managing office (district) terminates the negotiation with the most qualified firm. Once the most qualified firm is notified of the termination, negotiations with the second most qualified firm begin. TxDOT at this point, is not allowed by law to re-negotiate with the most qualified firm.

b. Practice

In practice though, the managing office and A/Es agree upon rates most of the time, and the most qualified firm is awarded the contract. TxDOT rarely contracts with the second most qualified firm (less than 1% of contracts proceed with second most qualified firm). Also, it has been the observation of TxDOT staff that whenever they mention terminating the negotiation and moving to the second most qualified firm, the first firm generally agrees to TxDOT proposed rates. This anecdotal information indicates that the A/E firms are more amenable to negotiations when they realize that their contract with TxDOT is not granted due to their being the most qualified firm, and there is competition for the contract. TxDOT staff members indicate that the negotiations conducted by inexperienced staff tend to not be very strong, and A/Es seem to have an upper hand coming in to those negotiations.

The overall contracting process tends to take about 6 to 8 months from initial NOI to final contract, with the negotiations taking up to two months of that time. Moving to the second most qualified firm increases the time it takes to contract, since the districts need to invite the second firm, and the consultant contracting office needs to review the documents. This can add about two to four months to the contract process. The TxDOT contracting team is usually under immense pressure to complete the contracting process as soon as possible to get the project started. This effectively reduces TxDOT team's incentive to move to the second most qualified firm.

6. Current Contracting Time Frame

a. Procedure

TxDOT QBS contracts involve both the managing office (district) and the headquarters' consultant contract office's effort. The overall process includes checks and balances to ensure that the process is conducted according to TxDOT procedures and applicable laws. This process requires information exchange between the districts and headquarters and headquarters approval at various steps of the process.

b. Practice

While the contracting time frame was not evaluated in this analysis, interviewees expressed concern that the process takes a long time (6 to 8 months), and could be shortened to make the process more effective. Interviewees mentioned that a shorter process would also allow districts to issue more project-specific contracts than using indefinite deliverable contracts.

D. Recommendations

The following recommendations address changes in TxDOT business practices to more successfully address cost and competition within the constraints of QBS. The recommendations involve building on current policies, practices, and procedures to provide greater specificity and consistency to enable the negotiation of fair and reasonable price for A/E services.

Recommendation 1: Establish greater specificity for TxDOT business objectives and guidelines for TxDOT negotiators to apply during negotiations.

The intent of this recommendation is to provide greater specificity regarding what fair and reasonable means to TxDOT. Implementation of this recommendation should leave the negotiator flexibility but it also needs to provide specific ground rules to use as a basis for each negotiated item. For example, TxDOT might want to ask for a reduction in overhead rate for a large indefinite deliverable contract or seek to negotiate the overhead rate if a firm's overhead is more than one standard deviation above the average. The various labor categories used by A/Es should be standardized across districts to enable easier comparison of hourly rates around the state. This will provide the contract managers with useful information during contract negotiations.

Recommendation 2: Implement organizational development and training to strengthen project procurement and negotiation competencies.

This recommendation addresses the current situation in which many TxDOT personnel do not have the background and experience to effectively negotiate. The recommendation fits within part of a broader cultural and organizational change that would focus on project cost and project scope management within project delivery. Under this recommendation TxDOT will provide training, support, and tools to TxDOT contract managers to help improve their negotiation skills.

We recognize that TxDOT does currently provide training and has been adapting and improving this training. The additional training recommended here should focus on negotiation strategies, tactics, countermeasures, communication styles, etc. This will better prepare the contract managers for overall negotiations in the contracting process. Increased familiarity with the negotiation process will also allow the contract managers to decide when to move on to the next qualified firm or when to agree to an A/E firm's terms.

Recommendation 3: Maintain information on A/E contracts and negotiation outcomes to support TxDOT personnel during negotiations.

This recommendation is to specify the information on current and past contracts that can better support negotiations. This includes maintaining a historical record of all negotiations and rates. More analysis should be conducted around the practices in other states regarding negotiation tools, and input from TxDOT contract managers should be obtained to develop tools with appropriate features and capabilities.

Recommendation 4: Review A/E procurement including the use of indefinite deliverable contracts in the context of TxDOT project schedule, project cost, and project scope management

This study identified concerns by TxDOT personnel regarding consultant cost management and the length of time it takes to procure A/E services. Analysis of these issues was not the subject of our analysis. However, based on our understanding of project delivery management best practices and observation on TxDOT's situation, we understand that the most effective way to evaluate the outcomes from A/E procurement and management practices is by evaluating project cost, project schedule, project quality, and project scope management. Such an analysis focuses on TxDOT's product "plans that are biddable and buildable".

As part of such analysis, the use of indefinite deliverable contracts should be evaluated based on the use by each district to determine the current contract limits, current use of contracts to acquire non-professional services as add-ons to professional services, and the use of contracts to essentially circumvent a project-specific process. Dye Management Group, Inc. believes that some of the larger districts might benefit from an increase in the limit on indefinite deliverable contracts. At the same time, the oversight provided on the use of indefinite deliverable projects should be evaluated to ensure that are used to procure strictly A/E services and not as a work-around to procure other non-professional services faster.

IV. Consideration of Cost in Architectural and Engineering Services Procurement



To evaluate whether TxDOT can benefit from the application of market forces and competition that considers the cost of services in the procurement of A/E services, the study approach involved determining how other jurisdictions and the private sector consider cost in their procurement.

This section provides the findings from this assessment of where cost has been considered in the procurement of A/E services by TxDOT and other jurisdictions. It also provides perspective on private industry – primarily developers’ practices. The findings are presented in subsections that address:

- Where TxDOT currently considers cost. This is limited to Comprehensive Development Agreements (CDAs) where cost is one component in the assessment of best value. This section also considers private sector practices under these agreements. The procurement of A/E services by project developers and design-build prime contractors is not regulated and some observations on these practices are made.
- Experience in other governmental agencies in North America. There are a small number of governmental agencies in the United States that are not precluded, under their state laws, from considering cost when procuring A/E services, for highway projects or vertical construction using state funds. Canadian provinces do not face the same restrictions and have methods for considering cost.

A. Where TxDOT Currently Considers Cost

TxDOT has the legal authority to consider value and hence cost when A/E services are provided as part of a Comprehensive Development Agreement (CDA). CDAs are not bound by the Brooks Act and cost can be considered.⁹

CDAs may involve different procurement models such as design-build or a concession agreement. In all cases, the A/E services are one element of the work required to deliver the project. As a matter of policy, TxDOT seeks to maximize competition in the CDA procurement in order to get the best deal for its customers. The procurement process involves comparing private sector proposals based on their value. Within these procurements, the A/E services constitute a relatively small proportion of the work; nonetheless, this procurement method results in the consideration of cost as one factor in the determination of best value.

⁹ CDA procurement follows Chapters 91, 223 and 227 of the Texas Transportation Code; Title 43 - Sections 27.1-7.5 of the Texas Administrative Code; Texas House Bill 2702; US Code Title 23 and Federal Highway Administration/SEP-15 Rules

1. Design-build

There are two main types of approaches to CDAs. The first is design-build, which is a project procurement method most frequently used when scope is well-defined, funding comes from the public sector, environmental regulations have been identified and are manageable, and right-of-way acquisition is already initiated. The design-build CDA in this case serves as a way for the public sector to transfer risk to the private sector through a lump-sum price and guaranteed delivery date. In turn, TxDOT as the owner is able to benefit from the industry economics and engineering management practices enabled by this delivery method. The procurement involves a best value selection and generally price is one element. This is different from a low bid approach and price can be weighted along with other criteria. The purpose of this Dye Management Group, Inc. study is not to evaluate the use of design-build by TxDOT. The ability to use design-build is identified here because it is a mechanism that TxDOT already has the authority to use for considering value and cost in project procurement.

The design-build method in practice addresses one of the main A/E industry arguments against considering cost in design work – namely that quality will suffer. It also enables the owner – TxDOT-- to negotiate around price. The design-build method actually enables value engineering and constructability to play a more integral role than in tradition design-bid-build. The designer works in union with the builder, construction costs are known early in the project. Further, input from prime design-build contractors indicates that there is negotiation with their A/E subcontractors on cost, however, the design-build model enables consideration of work performed – not the labor input. Therefore, firms look to establish longstanding partnerships that produce quality work at prices that make the design-build proposal competitive.

2. Concession Agreements

In the case of a concession agreement, a CDA is a public-private partnership which brings together non-governmental entities to aid in all aspects of finance, design, construction, maintenance, and operation of a project. Incorporating private sector financing, expertise, and efficiencies reduces costs and timelines. TxDOT has a well defined procurement process designed to select the project proponent that offers the best value. Again, TxDOT's policy goal is to maximize competition in this process so that government as the owner is able to obtain increased value. The outcome is a contractual agreement that provides a performance based specification for the project. This project delivery method transfers risk to the private sector which is responsible for the financing, design, construction, maintenance, and operation of the facility under the negotiated financing agreement.

The project proponents or developers of concession projects purchase as private entities A/E services. Discussion with industry representatives indicates that market forces are at work in the negotiations that take place between project developers and the firms that provide professional services. The relationships appear to be deal

specific and the project proponents will “shop” for A/E services from project to project. Communication with larger A/E firms suggests that as they gain more experience with concession models that their profitability is less and business risks are greater when participating in concessions than in design-build. While we do not have systematic data, this appears to be because there is more deal-specific price competition for the A/E services in a concession agreement than in design-build procurement where qualifications and long term working relationships rate highly.

In the concession model TxDOT benefits from price competition. In this model, it is not TxDOT’s business how A/E firms are compensated and whether or not there is price competition for their services. TxDOT’s focus is on the cost and value of the ultimate product- not the inputs.

3. Professional vs. Non-Professional Services

It is important for TxDOT to clearly categorize professional and non-professional services due to the differences in procurement process and considering cost as a selection factor.

Current Texas law (Subchapter A, Chapter 2254, Government Code) defines the term “professional services” and mentions that, among others, architecture, land surveying, and professional engineering services are considered professional services. Further, it defines professional services as those services provided in connection with the professional employment or practice of a person who is licensed or registered as, among others: architect, land surveyor, or a professional engineer. These professional services, by law, require procurement using QBS.

In practice, other services, like IT services (programming, management) are not considered professional services, and are not required to be purchased using QBS. TxDOT considers price as a factor in the procurement process of these services.

Some other services (e.g. traffic surveys) that used to be considered professional services are now considered non-professional services, and TxDOT now considers price in procuring these services. Feedback from interviewees suggests that in the case of traffic surveys, the cost for procuring the services has been reduced, competition has increased, and there is no substantive information indicating any change in the quality of work conducted.

Work authorizations on indefinite deliverable contracts sometimes blur the line between professional and non-professional services when non-professional services (e.g. Web designing) are bundled in A/E contracts primarily to avoid a lengthy procurement process.

It is important for TxDOT to re-evaluate services that are considered professional services, and to properly use indefinite deliverable contracts, to ensure maximum return on the contract spending each year.

B. Other Agencies' Consideration of Cost

Research was undertaken to identify other governmental agencies that consider cost in the procurement of A/E services. This information was then used to provide perspective on the opportunities available for TxDOT to bring price competition to bear in the procurement of A/E services.

The analysis found very few governmental agencies use a non-QBS method for the procurement of A/E services; most agencies are precluded by the Brooks Act and their state laws to do so. Seven states and three Canadian provinces were identified as having processes that consider cost in levels of varying capacity. For the states, these processes can only apply to state funded projects – federal projects are driven by the Brooks Act. Several of these states (and provinces) not bound by the Brooks Act still procure A/E services using QBS, and others have only slight variations on the process. Exceptions include Iowa, South Dakota, Vermont, and the Province of Ontario which have processes significantly different from standard QBS.

Exhibit IV-1 summarizes the findings from a scan to identify governmental agencies that have the authority to and have a process that considers price in the procurement of A/E services.

Exhibit IV-1: States and Canadian Provinces Using Non-QBS in A/E Services Procurement

| | Agency | Procurement Method | | |
|------------------|----------|---|--------------|----------|
| | | Qualifications-Based, Best Value (QBBV) | Two Envelope | Low-Bid |
| Alaska | | | | X |
| Iowa | X | | | |
| Maryland | X | | | |
| Massachusetts | X | | | |
| Minnesota | | | X | |
| South Dakota | X | | | |
| Vermont | X | | | |
| Alberta | X | | | |
| British Columbia | | | X | |
| Ontario | X | | | |

The most common alternative to QBS is Qualifications-Based, Best Value (QBBV) selection. It is important to note that this is not a low-bid approach and the term QBBV is a broad classification encompassing any procurement process that considers both value (cost) and qualifications when selecting an architectural or engineering provider. As shown in Exhibit IV-1 several states and Canadian provinces use modified or non- QBS methods for A/E procurement that involve some consideration of cost.

States and provinces using QBBV include: Iowa, Maryland, Massachusetts, South Dakota, Vermont, Alberta, and Ontario.¹⁰¹¹¹²¹³¹⁴ Other states, such as Alaska, parallel QBS in their procedural requirements without specifically using the acronym or referencing the Brooks Act.¹⁵ For example, on some state funded projects, Alaska considers cost and hourly rates by labor classification alongside experience and approach. Minnesota uses a low-bid system and British Columbia uses a modified dual-envelope system.

The application of the non-QBS methods are described in turn.

1. Qualifications Based Best Value (QBBV)

QBBV considers both value and qualifications when selecting a service provider. Typically QBBV considers cost as a criterion, weighted along with other non-price based factors. In general, there is similarity between how QBBV is applied and the typical design-build procurement. The most typical form of QBBV is the pre-qualification process. Other variations include resource budget allocation selection, modifications to the two-envelope system, a cost-weighted method, or any combination of the above.

These QBBV practices are detailed below.

a. Pre-Qualification

The most common form of QBBV is the procurement of services through a pre-qualification process. Before a firm can bid on a project, it must pass minimum standards set forth by the agency. What determines a qualified or responsible bidder varies by agency; some agencies place more emphasis on cost-control or value, while others place more emphasis on technical qualifications or innovation. Firms meeting the established minimum qualifications are put on a “retainer list” and are then eligible to compete in a process that considers: cost, highest concession, or any other preferred method of price evaluation. This process determines the “lowest responsible bidder” or “lowest qualified bidder”-

¹¹ Massachusetts Highway Project Development Chapter 2.6

¹² Iowa Administrative Code 11-105.9(8A)

¹³ Vermont Agency of Transportation Policies and Procedures on Prequalification, Bidding and Award of Contracts

¹⁴ Alberta Infrastructure Consultant Selection Policy for Contracted Consulting Services

¹⁵ AL-ST 41-16-21

the firm that provides the best value and efficiency and the highest quality service at the lowest price. The lowest-bidder among the pool of qualified bidders wins the contract without the threat that the quality of selected firm is somehow diminished because of low-cost.

This process has the benefit of considering cost early in the procurement process resulting in time and expense savings. The state can negotiate with several firms simultaneously and does not have to put out a bid for qualifications for each new proposal.

Often under QBS, the top three firms are all qualified to do the work and could perform to a high standard. QBBV allows for these same qualified firms to then compete in a process that includes and provides for market-based price competition. In such a process the highly qualified firm has price advantages because their specialized expertise and understanding should provide a competitive advantage because their labor would be more productive. They would require less labor input-hours to do the work. In this way, QBBV does not replace a qualifications based selection approach; rather, it supplements the process.

b. States use different approaches to QBBV prequalification:

Iowa qualifies firms through a single RFP, which requires them to put together a pricing schedule for a fictitious sample project. Once on the qualified list, a firm is guaranteed to receive a contract at some point, although the dollar amount of this contract is not specified. This process saves time and money for both the government and the firms because each new project can draw from a pool of pre-qualified applicants and does not have to go through a new proposal process. Firms are limited by state regulation to no more than six consecutive years on the list at which point they must re-qualify.

In Ontario, outside pressure from the United States' A/Es and various interest groups has influenced the pre-qualification process. Although the Ontario Ministry of Transportation still uses cost as a selection criterion for pre-qualifying architectural and engineering consultants, the influence of this number has substantially decreased from a historical high of 50% to only 10% today.

2. Resource Budget Allocation Selection

The Alberta Department of Transportation uses a variation of QBBV called “resource budget allocation selection” when procuring architectural and engineering services. This process is meant to emphasize how resources are allocated across a project, such as level of effort or skills of assigned staff members. Cost is 10-20% of evaluation criteria. The lowest cost often does not win because the firm may not have allocated their resources properly. The pre-qualification process itself is open to any firm year-

round and the department shortlists three firms for each project. Because there is no open-call for every proposal, much time is saved. Furthermore, if there are cost savings as a project moves forward, the government takes 35% back and refunds 65% to the consultant rewarding and reinforcing efficiencies.

3. Two-Envelope System

In typical QBS protocol, a firm negotiates cost only after they have been selected based on their qualifications. This process is time-consuming because it must proceed in two distinct stages: qualification review and selection then cost assessment. It also does not provide any mechanism for firms to “sharpen their pencil” and consider market conditions in pricing.

Under QBBV a two-envelope system is used that speeds up the process; firms proceed simultaneously with both stages. In the two-envelope system, a firm submits qualifications in one envelope and price in another. The highest qualified firm is selected and only then is the second envelope, the fee envelope, opened. This enables price negotiations to begin immediately. Beyond timing distinctions, there is no difference between a two-envelope system and QBS.

In theory, the two-envelope system could be enhanced to consider cost further. In a cost-weighted two-envelope system, firms would have their second envelopes (fee envelope) opened and the fee disclosed. This fee would then be weighted in value and added to the points scored in the first qualifying envelope thus enabling cost to be a consideration in the initial qualification process. It would be up to the discretion of the review committee as to how the cost is weighted in relation to other qualifying criteria. Dye Management Group Inc. was unable to identify any agencies which practiced this variation of the two-envelope system.

The two-envelope system, in practice in British Columbia, is detailed below:

British Columbia Ministry of Transportation (BCMoT) procures engineering and contract services through a two-envelope system. BCMoT uses a Registration, Identification, Selection and Performance Evaluation program (RISP) system to pre-register contractors. This pre-qualification is based on the overall firm and the services they could potentially provide. For contracts under \$1 million, three prequalified consultants from a retainer list are chosen for a project based on the firm’s maximum contract capacity, the amount of time the firm has gone without being awarded a contract, and whether or not the firm matches the registered fields of expertise. The selected firms are invited to submit proposals.

A proposal consists of two envelopes. The first outlines the firm’s qualifications, and the second defines the project’s cost (fee). The qualification envelopes are opened first and the most qualified firm is then selected. The difference between this qualification stage and the original prequalification process is that at this point, the qualifications

are based on the specific team within the firm that is available to work on the project. (The original prequalification process looked at the firm as a whole). Next, the fee envelope for the winning firm is opened and negotiated. If this firm successfully negotiates cost, the other firms have their envelopes returned unopened. If the first firm is not able to successfully negotiate, the second qualified firm is contacted and the price negotiation process begins anew. Proposals are encouraged to include construction cost cutting (value engineering), and bonus points are awarded to firms that provide this information.

a. Cost Performance Assessed in Prequalification

Another variation is the cost-weighted method is the indirect evaluation of past cost-control. Historical ability to remain within budget and control-costs and overhead can be included as a prequalifying criterion. For example, a firm that has historically stayed within budget for previous projects can be awarded additional points in the prequalification process. This enables cost to become a qualifying factor without actually considering the cost of the project at hand. British Columbia and Ontario provide examples of a cost-weighted procurement method in practice:

In British Columbia, only for projects over \$1 million does cost play a role in the initial selection of an A/E firm. Cost is weighted as a qualifying factor and is considered in the first stage of the two-envelope procurement process. For example, a firm that has historically controlled costs will score higher in the qualification round than a firm that has been consistently over budget. In British Columbia, the influence cost plays is based on the type and scope of a project. This influence has never been a major factor, anywhere from 5-10%. In Ontario, a firm's cost comprises 10% of prequalification criteria while technical ability and past performance comprise 40% and 50% of qualification criteria respectively. Previously, criteria were 20%, 30% and 50% respectively, marking the declining influence cost plays in the pre-qualification process. Flexibility in prequalification criteria enables agencies to balance cost performance with other factors as they see fit.

TxDOT QBS process also offers a similar alternative – consideration of past performance as a selection criterion, where past performance encompasses quality, schedule, and budget. TxDOT generally weighs past performance at no more than 5% of the selection factors.

4. Low Bid

Only one governmental agency was identified as using low-bid to procure A/E services.

Minnesota, which uses the low-bid system, is the only state not to require any pre-qualifications for bidding on a contract, although first time bid-winners must provide qualifications after winning a bid.

5. Results from Experience Elsewhere With Non-QBS Procurement

We did not identify any quantitative assessments or similar empirical analysis regarding QBBV outcomes compared to QBS. Our fact-finding obtained input from the agencies administering non-QBS procurement on their views regarding benefits and costs. The small number of agencies using non-QBS procurement provides limited experience to draw on, however, following are conclusions from the interviewees:

- **Interviewees believe that their process saves time and reduces costs**

Cost savings are realized because the non-QBS process increases competition among firms. Procurement takes less time compared to QBS because cost is evaluated along with qualifications. Considering cost up-front can significantly shorten the procurement process. For example, the Vermont interviewee concludes that considering cost during selection shortened the procurement process on average between 4 to 12 weeks without influencing the quality of the firms selected.

- **There are challenges to pricing projects with undefined scope**

Interviewees cited the need to have a well defined scope to come to an agreement on pricing. This is essential in order to ensure comparison between proposals. However, in a process in which cost is 10% or 20% of the weighting and qualifications the balance, the cost element essentially works to screen out uncompetitive proposals and forces the proposing firms to consider their pricing in the bid.

- **Industry resistance towards non-QBS**

Interviewees report that A/E professionals are not trained to focus on producing the best product for the lowest cost, and are somewhat resistant to submitting cost proposals. The interviewees reported that they have no indication that QBBV reduces the quality of the final product in their process.

- **Administering non-QBS procurement requires higher levels of technical involvement**

Considering cost as a factor requires that the agency's project managers have a clearer idea of what the scope is and the project requirements. A detailed scope ensures that all A/Es interpret project scope consistently, and the cost proposals can be evaluated consistently. This usually requires a higher time commitment and technical competency from the agency staff compared to QBS.

C. QBS Compared To QBBV Selection

As detailed in the prior section, there is extremely limited application of non-QBS procurement by government of A/E services. QBBV is used to procure other types of professional services such as information technology, legal services, and other advisory services. Given the limited empirical basis Exhibit IV-2 provides a descriptive and more theoretical comparison of the differences between a QBS and QBBV selection.

Exhibit IV-2: QBS and QBBV Comparison

| Factors/Criteria | QBS | QBBV |
|---|--|---|
| Quality | Selection is based solely on qualifications and can be used to ensure the most qualified firm is selected. | The weighting placed on quality and the mechanism used affects the outcome. In general as seen with design-build a weighting of 10% for cost can introduce some price competition among comparably qualified firms. |
| Project scope clarity | One of the principal reasons in support of QBS is the lack, at the time of selection, of a definitive scope of work for such services and the importance of selecting the best-qualified firm to assist in the development of such scope. If you are better qualified you may know what it really takes to do the work well. Since the scope of work is not well defined, proposals are not comparable in scope. Lower-cost designs may not take into account the full scope of the project and can result in added design costs and higher construction costs. | If a project scope is well defined, A/E firms should be able to provide an estimate for the project, allowing the client to compare costs. This can be done either as a lump sum, or as hourly rates and number of hours to design the project. |
| Best value for money to the owner (Lower lifetime costs) | Proponents of QBS argue that A/E services are highly specialized, and a highly qualified firm can help lower lifetime costs (construction and maintenance) though there is no research that supports it. | There is no research that supports or rejects the claim that QBBV provides better value for money. |
| Cost savings | QBS does not provide A/Es with any incentives to cut costs and provide clients with a better cost for the design phase. Compensation is usually based on inputs – labor required to perform the work. | QBBV can result in cost savings during design phase since all companies are required to include cost as a factor, inducing cost competition and offering better value to the client. |

| | | |
|-----------------------------------|---|--|
| Objectivity | QBS offers objectivity when the selection factors are well defined, and the decision making process is conducted at multiple levels, and not just one entity. | QBBV provides a more objective measure: Cost as a consideration, further avoiding possibility of favoritism and fraud. |
| Market Forces | QBS does not enable government to benefit from market forces. If there is less work for A/E firms to bid on or more competition in the market the process does not enable government to yield a price benefit. | QBBV brings market forces to bear. |
| Competition | QBS is very competitive based on qualifications. Government as the owner can craft criteria that maximize competition. However it tends to provide barriers to entry because if you are not well qualified it is hard to get qualified. | QBBV opens the process to smaller companies who are newer in the business and willing to work at lower profit margins. |
| Process efficiency: Time consumed | QBS can take longer than QBBV since the qualifications are evaluated first, followed by cost negotiations | QBBV can take a shorter time since cost is obtained upfront from A/E firms |

In comparing QBS and non-QBS both procurement methods have unique benefits and some shortcomings. Exhibit IV-3 below makes conclusions regarding which type of project both methods are best suited for.

Exhibit IV-3: Suitability of QBS and QBBV

| | QBS | QBBV |
|-------------|--|--|
| Best Suited | <ul style="list-style-type: none"> When the project scope is not well defined at the time of procurement When the project design is complex and similar work has not been performed by the agency before | <ul style="list-style-type: none"> When the project design is expected to be simple and the agency has plenty of experience with similar projects When the project scope is well defined and any one of a number of qualified professional service firms could equally well do the work. For example, preparing designs for pave mainly reconstruction work within the existing alignment. |

The use of either method primarily revolves around the project scope. If the scope of the project is not well defined, it is very difficult for the client to determine all the specific qualifications that are required for the project. More importantly, the client cannot decide if a particular qualification is not necessary for the project. The less the required qualifications, the broader the playing field. A vague or general scope will therefore lead to the selection of a firm with the most qualifications, and cost cannot be regarded as a factor.

If the scope of the project is well defined, it is easier for the client to consider cost as a factor on the project, and even consider cost as a major selection criterion. As a result, it is important that the client using QBBV is more sophisticated, and has enough resources to properly scope the design in-house to avoid different scope interpretations. If the client does not have enough resources in-house, then it will be difficult to properly scope the project and negotiate work hours/level of effort based on the project scope while keeping the project risk low. This same situation is applicable on D-B contracts.

D. Conclusions and Recommendations

The overall observations and recommendations presented below address the opportunities for TxDOT to maintain quality and improve value through using non-QBS A/E procurement methods.

1. Conclusions

- **Our analysis identified a number of barriers to TxDOT realizing business benefits from the cost savings from non-QBS procurement**

Our analysis has neither found quantified examples elsewhere nor been sufficient to specify net business benefits to TxDOT of implementing non-QBS procurement for A/E consultant services. Given the barriers to changing the current process, our conclusion is that TxDOT should first ensure that within the legal constraints of the current QBS process TxDOT gets the best possible value, fosters competition, and is better positioned to negotiate a fair and reasonable price.

We arrive at this conclusion because to apply an approach such as QBBV would involve the development of institutional capacity to ensure that scopes are well developed and reach the necessary contractual agreements. Further, the approach is most applicable on fairly standardized design projects which are not the most costly. Implementing QBBV would also require significant change management to ensure that the use of QBBV provides significant benefits to TxDOT. TxDOT also can address risk transfer, value and cost through increased use of design-build for project procurement.

- **Implementing non-QBS procurement is a major departure from current practice**

While it seems intuitive that price should have some consideration in the selection of consultants that provide some \$450 million a year in A/E services, only a decreasing handful of states use procurement methods other than QBS. As a result, for TxDOT to pursue non-QBS procurement would be a major departure from practice elsewhere. It would require changes to state law that would be strongly opposed by the A/E services industry and be a process that could be applied only to state funded projects.

- **There are almost no examples of governmental agencies using non-QBS procurement methods**

Research finds very few examples of governmental agencies that consider cost in A&E consultant procurement. Further, the trend for those agencies that have the authority to consider cost is actually towards a QBS type of approach.

- **Circumstances where non-QBS procurement is most viable is where there are well defined straight forward scopes of work**

The principal barrier to the consideration of cost is the need for a well defined scope of work. The nature of much preconstruction work is that there are unknowns and that it is important to apply the required labor to produce a quality project. Therefore, the circumstance in which non-QBS procurement is most viable is for straightforward projects for which the preconstruction engineering is well defined. Examples include pavement preservation-type projects. For even more simplified projects it is possible to define a performance-based construction specification that accounts for any design requirements. For example, Utah Department of Transportation has used a pave mainly construction specification. Under this specification, the construction project repaves the existing roadway to the agencies specifications. Therefore, if guard rail needs raising or other improvements they are all made during construction.

- **TxDOT can benefit from modifying the current process within QBS**

Dye Management Group, Inc. believes that TxDOT can obtain significant benefits through improving the current process within the confines of QBS. Specific recommendations for improvement and areas for further analysis are mentioned in section III-C (*TxDOT administration of QBS-Recommendations*). These areas primarily revolve around strengthening negotiation practices, organizational development and training, the definition of professional versus non-professional services, and increasing the number of projects for which there is a specified project scope that consultants propose on.

2. Recommendations

Recommendation 5: Limit the dollar value of non A/E work performed through A/E contracts

To introduce price competition, TxDOT should limit the dollar value of work that can be exempt from QBS that is performed through A/E contracts. This threshold should be high enough to ensure that TxDOT benefits from the economies of scale on a full service A/E project. However, TxDOT should establish a clear definition of non A/E services. Specialty services with term agreements and purchase orders can be procured with consideration of price. For example, travel surveys, market research, and public involvement, might not require a professional engineer and might not be considered a professional service.